

AD-A086 448

OPERATIONAL RESEARCH AND ANALYSIS ESTABLISHMENT OTTA--ETC F/8 5/4
THE SALT TREATY FROM A CANADIAN POINT OF VIEW, (U)
APR 80 G R LINDSEY

UNCLASSIFIED ORAE-R74

NL

OF 1
ADDRESS



END
DATE
FILMED
8-80
DTIC

ADA 086448

LEVEL

3

UNLIMITED
DISTRIBUTION
ILLIMITÉE

THE ONLY SOURCE FOR A
COMPREHENSIVE LIST OF THE

D

DEPARTMENT OF NATIONAL DEFENCE
CANADA

OPERATIONAL RESEARCH AND ANALYSIS ESTABLISHMENT

14 ORAE R74

16
THE SALT TREATY
FROM A CANADIAN POINT OF VIEW,

by

10 G.R. LINDSEY

This report does not necessarily represent the views
of the Canadian Department of National Defence.

OTTAWA, CANADA

Accession For	
NTIS GRI&I	<input checked="checked" type="checkbox"/>
DDC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
Dist.	Avail and/or special
H	

11
APR 1980

409123

ABSTRACT

✓
With or without SALT II there are several strategic imbalances that will cause difficulties in the years ahead. Ratification of SALT II will not solve them, but it would permit programs that would redress them, and would preserve the opportunity to negotiate agreements in the future that could reduce the probability that each side will simply try to solve its problems by extensive uncontrolled buildup of weapons. All the SALT II protocol does is to confirm that any form of arms control over mobile ICBMs or cruise missiles was too difficult to complete in 1979.

What with the problems of cruise missiles, European systems threatening the USSR directly, and the existence of independent British, French, and Chinese nuclear forces, a SALT III that addressed these subjects would face extreme difficulties, with little hope of easy or early progress.

Canada has a vital interest in the preservation of strategic nuclear deterrence, enhanced by our geographic location down-wind from US missile fields. She also has a stake in the success of nuclear deterrence in Europe.

RESUME

Que les entretiens sur la limitation des armements stratégiques (SALT II) aboutissent ou pas, plusieurs déséquilibres stratégiques ne manqueront pas d'amener des difficultés, au cours des années à venir. La ratification des SALT II ne les corrigerait pas, mais elle permettrait, indirectement, la mise de l'avant des programmes qui pourraient en venir à bout, et, partant, de préserver la possibilité de négocier ultérieurement des accords pouvant atténuer, d'un côté comme de l'autre, la probabilité d'une vaste prolifération incontrôlée des armements, dictée par un simple effort pour résoudre ces mêmes problèmes. Or, le protocole annexé (SALT II) se contente de confirmer que des difficultés ont empêché d'entériner, en 1979, toute forme de maîtrise de l'armement, axée sur les ICBM mobiles ou les missiles de croisière.

Et puis, compte tenu des difficultés que posent les missiles de croisière, les systèmes européens, braqués directement sur l'URSS, et l'existence de forces nucléaires britanniques, françaises et chinoises distinctes, des entretiens SALT III qui se consacraient à de tels sujets seraient extrêmement difficiles et tout espoir de règlement facile et précoce serait bien mince.

Il est vital pour le Canada de conserver des moyens de dissuasion stratégiques d'un conflit nucléaire; c'est là une nécessité qu'intensifie d'autant sa proximité des missiles américains. Le Canada a également tout intérêt à ce que la dissuasion nucléaire réussisse, en Europe.

THE SALT TREATY
FROM A CANADIAN POINT OF VIEW

Abstract.	i
Resume.	ii
Acknowledgement	iv
Introduction.	1
The Three Offensive Strategic Nuclear Weapons Systems	1
Stable Strategic Nuclear Deterrence	4
Twenty Years of Strategic Nuclear Weapons	5
New Strategic Weapons Currently Under Development: The SALT II Protocol.	8
Inequalities in the Strategic Balance	10
Verification.	14
Canadian Point of View As A Member of the United Nations	17
Canadian Point of View As An Ally And Neighbour of the United States	17
Canadian Point of View As A Member of the North Atlantic Alliance.	18
Summary	19
Figures 1 to 3.	21

ACKNOWLEDGEMENT

The author would like to acknowledge the useful comments and criticism made by colleagues in the Departments of National Defence and External Affairs on earlier drafts of this paper. The views expressed do not necessarily reflect official government policy.

THE SALT TREATY
FROM A CANADIAN POINT OF VIEW

INTRODUCTION

1. Although the Strategic Arms Limitation Talks and the agreements deriving from them deal with weapon systems, verification, and similar subjects in the realm of military and defence concerns, they have a significance extending well beyond these areas. In fact, the significance of SALT for detente between superpowers, for East-West relations, for the prospects for arms control in broader spheres, and for international relations in general probably exceeds its significance for bilateral strategic stability.
2. It has been said that there are two different frameworks for arms control - technical and political - and that the West uses the first, the East the second, with consequent failures of communication. This paper adopts the framework of technical, military, and strategic considerations. It will confine itself to those aspects of SALT directly related to the military balance. It will, however, extend to some remarks on the possible developments in nuclear forces in the European theatre, likely to be a subject of SALT III.
3. A Canadian perception of SALT can be as a member of the world community of nations, as a North American neighbour and ally of the United States, or as a member of the North Atlantic Alliance. In this paper, an effort will be made to address all three perceptions.

THE THREE OFFENSIVE STRATEGIC NUCLEAR WEAPONS SYSTEMS

4. The primary subjects of negotiation in SALT and of Western analysis of the strategic balance, are the three types of offensive nuclear weapons systems often described

as the "triad". These are Intercontinental Ballistic Missiles (ICBMs), Submarine-Launched Missiles (SLBMs), and Heavy Bombers.

5. The effectiveness of offensive systems is, of course, dependent in part on the capabilities of those defensive systems designed to frustrate their purposes. Active Ballistic Missile Defence Systems were limited in the Treaty emerging from SALT I, leaving ICBMs and SLBMs virtually unopposed by active defence, once launched on their trajectory. However, systems to warn of missile attack, and defensive systems designed to oppose bomber aircraft or submarines have not been affected by either SALT I or SALT II.

6. Heavy bombers, not covered in SALT I, have been defined in SALT II, in terms of the existing B-52, B-1, Bear, and Bison, to include future aircraft with capabilities similar to these, and aircraft able to launch long range cruise missiles (ALCMs) or Air-to-Surface Ballistic Missiles (ASBMs). Bombers are able to carry very large payloads, hence large numbers of weapons or weapons of very large destructive power. However their ability to penetrate modern air defences is very much in question, which is the chief reason for the plans to equip them with "stand-off" weapons such as ALCMs or ASBMs which could be launched while the aircraft was still far from the intended target. Another vulnerability of bombers is associated with their normal location on major airfields, easily destroyed by SLBM or ICBM attack.

7. Intercontinental Ballistic Missiles are the most accurate of the strategic weapons, and one missile is now able to deliver several warheads (Multiple Independently

Targeted Reentry Vehicles - MIRVs) to different targets (which must be in the same general area). As accuracy is increased, the need for a heavy warhead with a large energy yield is decreased, and it would not be exaggerating to say that virtually any installation at an accurately known spot on earth can now be destroyed by an ICBM.

8. The increasing effectiveness of ICBMs against any type of fixed target implies that ICBMs may themselves be vulnerable to hostile ICBMs. Through the 1960's, the vulnerability of ICBMs was reduced by placing them in underground silos, and then hardening the silos in thick concrete armour. However, the combination of high resolution satellite photography and pinpoint accuracy in warhead delivery is advancing too fast and too far to be offset by the capabilities of static physical protection. It seems certain that the only means by which ICBMs (or any other objects) can be protected from missile attack are concealment or mobility. Another means could be by active defence, but its technical and economic feasibility is not certain, and significant deployment is prevented by the ABM Treaty.

9. Submarine-Launched Ballistic Missiles have the advantage of concealment prior to launch. They are somewhat less accurate than land-based systems, and suffer greater limitations on size. Reliable constant communication with the submarine can pose a problem. However, the near invulnerability of the launcher provides a very significant advantage.

STABLE STRATEGIC NUCLEAR DETERRENCE

10. The doctrinal underpinning of Western strategy depends on the concept of mutual and stable nuclear deterrence. It is by no means clear that this point of view is shared by the East. According to this concept, both opponents should be quite sure that, no matter what form of surprise attack might be launched against them, enough of their offensive weapons would survive to enable them to retaliate against the aggressor's population to a degree that would inflict unbearable damage. The margin of certainty should be such that it would not be upset by some minor change in intelligence estimates or notice of technical deterioration, should not supply any motivation to react precipitately in times of stress, or to conduct a preemptive first strike. In the language of the trade, the victim of aggression should possess an "assured countervalue second strike retaliatory capability", implying that a would-be aggressor is deprived of a "counter-force first-strike capability".

11. In principle, it should be possible to calculate the results of a first strike (by either side) against the weapons of the opponent, to know how many would escape destruction, to predict how much damage they would do in a retaliatory second strike, and to decide whether this damage exceeded the limit that the original attacker could bear. In practice, there are considerable uncertainties in each stage of such calculations, and planners could not be confident that they had an assured capability unless the calculation allowed for a substantial margin of error in the assumptions.

12. Starting from this base, further propositions of less fundamental status can be added. The concept of deterrence

can be extended to the levels of nuclear threats at the theatre level (as opposed to the direct confrontation between the two Superpowers, with the home territories of the USA and USSR engaged), and of conventional forces. The question of "coupling" or "linkage" between these three levels arises.

13. In an analysis of the SALT it is appropriate to consider the problems of deterrence at the level of the European theatre, and of the linkage between theatre and "central" or "strategic" deterrence. These are closely involved in the Protocol to SALT II, and very likely to be major issues in SALT III.

14. For the purposes of preserving stable deterrence, the most attractive weapon is the SLBM. The submarine's concealment reduces the vulnerability of the missiles, while their limited accuracy reduces their capability for a counter-force first strike against hard point targets. This latter limitation may be removed for future very accurate SLBMs such as Trident D5. ICBMs do have a first-strike capability, and if they are vulnerable themselves, they can have a destabilizing effect. Heavy bombers do not travel fast enough to be a good first-strike weapon, but their bases are very vulnerable to a first strike attack by missiles.

TWENTY YEARS OF STRATEGIC NUCLEAR WEAPONS

15. Nearly all of the history of strategic nuclear deterrence is contained in the last twenty years. The deployment of the systems is illustrated on Figures 1 to 3.

16. Figure 1 shows the deployment of Soviet and American ICBMs, starting in 1960. Plotted against the date (on the

horizontal axis) is "Throw Weight" expressed in kilograms, and representing the mass of useful material that the missile can deliver to its target, including reentry vehicles, penetration aids, and devices necessary to release these. All missiles characterized as "Intercontinental" have sufficient range to reach most of the important targets in the other country. The Throw Weight can be exploited to deliver one large warhead, several smaller ones, and/or various types of "penetration aids" which might be necessary in case the missiles were opposed by an active defence system. The height (or "thickness") of the areas representing each missile shows the number of independent warheads deployed at each moment of time.

17. Figure 1 shows that nearly all of the US effort has been in three versions of the comparatively small "Minuteman" missile. The first two versions had single warheads (of about 1 Megaton yield), but Minuteman III has three MIRVs, with yields of about 170 kilotons each and an accuracy (CEP) of about 0.2 mile, quite sufficient to provide a deadly threat to an airfield, city, or other "soft" point target, but not enough to give a high probability of destroying a small hardened target such as a missile silo. The 54 Titan II missiles have single warheads of very large yield (about 9 Megatons). Titan I and three versions of Atlas were so vulnerable as to invite preemptive attack, and were abandoned in 1964 in favour of missiles in hardened underground silos.

18. Figure 1 also shows that the early Soviet program included four "light" ICBMs, of which two have now been terminated (SS-7 and SS-8), and one very heavy one, the SS-9. The large Throw Weight of the SS-9 made it possible to project

one enormous warhead (25 Megatons) or several (3) large (4 MT) warheads. However, commencing in 1974 (after the signature of SALT I, but not in contravention thereof) three new ICBMs were deployed, each with a high Throw Weight and with MIRVs. The most significant is SS-18, the successor to the SS-9, with 10 MIRVs. Under the terms of SALT II, the Soviet Union must restrict itself to 308 "heavy ICBMs". They are converting the aging SS-9 into SS-18 at a rapid rate, giving themselves 3080 MIRV warheads. They are also allowed by SALT II to convert the obsolescent single-warhead SS-11 into the MIRVed SS-19 and SS-17.

19. As of 1980 it is evident that the Soviets have the greater capability and are rapidly increasing their margins of superiority.

20. Figure 2 shows the development of SLBMs. On these diagrams the vertical axis represents range of the missile (from the submarine), expressed in kilometres, while the height (or thickness) of the small areas representing SLBM types shows the number of independent warheads. The American Polaris A1 and A2 carried single warheads. Polaris A3 had three, but these were not independently targeted. Poseidon C3 has ten MIRVs, (on the average, though, it can carry fourteen), so that the area for Poseidon on Figure 2 represents ten times the number of launchers. Trident C4, just now coming into service, will carry eight MIRVs.

21. Figure 2 shows that the major Soviet investment in SLBMs is still in the SS-N-6, with a range considerably less than that (4600 km) of the American Poseidon C3, but that they are rapidly deploying SS-N-8, whose range (8000 km)

exceeds that of Poseidon or even the new Trident C4. SS-N-18, the solid-fuel successor to SS-N-8, will have at least three MIRVs.

22. On balance, the US has the greater capability, and will enhance their margins with the deployment of Trident.

23. The heavy bombers of both countries are shown on Figure 3, with the vertical axis representing payload (in kilograms) and the height of the areas for each type shows the number of aircraft. Although range is important, it is partially exchangeable for payload, and can be greatly extended by aerial refuelling. The quantitative and qualitative superiority of the USA is very evident, but the margin is less than it was in 1960, and it should be noted that the large Soviet investment in modern air defence has greatly reduced the capability of American bombers to penetrate to their targets.

NEW STRATEGIC WEAPONS CURRENTLY UNDER DEVELOPMENT:
THE SALT II PROTOCOL

24. There are two areas of development in the technology of strategic weapons which influence SALT II (and SALT III). One which has been mentioned already is the increased accuracy of ballistic missiles and their consequent threat to the hardened silos of opposing land-based missiles. The other is the long-range cruise missile.

25. Cruise missiles are not new. The German V1, used against London, Antwerp, and other targets in 1944 and 1945, was an effective strategic cruise missile. However, modern technology has provided radical improvement in propulsion

(allowing high subsonic speed over long distances), in guidance (allowing evasive routing at low altitude, and accurate terminal homing to the target), and in warhead (allowing a high-yield nuclear explosion from a comparatively small device). A cruise missile can now be designed which offers a small and difficult target, and is likely to have a much better chance of penetrating enemy air defences than a manned bomber. And, as a very attractive additional advantage, a cruise missile can be launched from the ground, from an aircraft, from a surface ship, or a submarine.

26. US technology is well in advance of the Soviets in these areas of propulsion and guidance. Moreover, weaknesses in NATO long-range theatre nuclear forces, soon to be exacerbated by the withdrawal from service of the British Vulcan medium bomber, make cruise missiles attractive as a means of strengthening deterrence in Europe.

27. These two developments were very much in evidence during the latter stages of the SALT II negotiations. To support American security, it was important to permit a form of deployment of a new ICBM which would provide invulnerability to the new accurate Soviet MIRV, by some combination of concealment and mobility, although it would be necessary to do this in a way that would not prevent verification by "national technical means". To prolong the useful life of the heavy bombers (especially after the cancellation of the B1), and to provide an opportunity for NATO to improve its weak capability in long-range nuclear deterrence, it was desirable to provide for the introduction of long-range cruise missiles. From the point of view of the USSR, who were rapidly catching up to the US in the design of accurate MIRV,

but who are thought to be behind in the technology of cruise missiles, it is probable that a total ban on both concealment and mobility of ICBMs, and on long-range cruise missiles would have been welcome.

28. In the event, these very difficult and important questions regarding mobile ICBMs and land and sea-launched cruise missiles have been relegated to the SALT II Protocol, which expires at the end of 1981. Since most of the relevant American programs (MX, GLCM, SLCM) would not reach the stage of deployment by that date, the Protocol amounts to little more than a postponement of negotiations that could not be concluded in 1979. The long range Air-Launched Cruise Missile is allowed under the SALT II Treaty, although subjected to the overall limits pertaining to heavy bombers, and the USAF is proceeding with its procurement for mounting ALCM on B-52 G and H bombers.

29. The clauses in the SALT II treaty forbidding circumvention through other states are unlikely to cause any problems with intercontinental weapons, or prior to the expiry of the protocol. However, provision of cruise missiles to their NATO allies could be considered by the Soviets as introduction of strategic weapons through third states. The NATO program for deployment of Ground-Launched Cruise Missiles in Europe will not antedate the expiry of the SALT II protocol.

INEQUALITIES IN THE STRATEGIC BALANCE

30. Although the numerical ceilings in SALT II are the same for each party, there are several aspects in which the strategic positions are unequal.

31. SALT II forbids the conversion of light or old heavy ICBMs into modern heavy ICBMs, or the construction of a new heavy ICBM. The consequences of this is to allow the USSR to convert their heavy SS-9s into heavy SS-18s, each with ten MIRV. Three hundred and eight SS-18s, plus 512 MIRVed SS-19s and SS-17s, allowed within the limit of 820 MIRVed ICBMs, would give them about 5600 megaton-sized warheads, almost certainly sufficient to provide a disarming first-strike capability against the American ICBMs and strategic airfields. The US is prevented from building an ICBM heavier than SS-19, (the heaviest of the light ICBMs), so that a considerable inequality in total Throw Weight is perpetuated in SALT II.

32. Geography established an inequality for submarine operations which works against the USSR. Two of its four fleets can be bottled up in the Black Sea and the Baltic Sea (unless they have deployed before the outbreak of hostilities), while its Eastern naval bases have their access to the Pacific impeded by ice and by the Japanese Islands. As a result, the Soviet Navy is obliged to rely very heavily on the submarine bases in the Kola Peninsula.

33. The geographic distribution of population and industry is more concentrated in the USA than in the USSR, which means that an American attack designed to inflict a certain level of damage on the USSR would require more weapons on target than would a Soviet attack designed to do the same amount of damage to the United States.

34. The nuclear forces of Britain, France, and China weigh against the USSR, although not counted in SALT I or

SALT II. Also, nuclear-armed aircraft on US carriers, and airbases in Western Europe place nuclear systems (whether operated by US or other NATO allies) much closer to Soviet territory than the distance from Soviet bases to any American territory other than Alaska.

35. The unequal limits negotiated in SALT I made allowance for these geographical factors and for the existence of the other nuclear powers. The USSR wanted to include the "Forward Based Systems" in the SALT II negotiations, and it is probable that their eventual agreement to omit them and still accept equal ceilings was a quid pro quo for the offsetting unequal balance on heavy ICBMs.

36. The common ceiling of 2250 for the total number of strategic nuclear delivery vehicles, to be attained by 1 January 1981, will require a reduction of 254 below the Soviet total announced for June 1979, but only 36 below the US total for the same date. Neither will suffer any significant degradation in these reductions. The USSR will probably achieve it by reducing the number of SS-11s, ICBMs first deployed in 1966, not equipped with MIRV, rather inaccurate by modern standards, and already reduced in numbers since 1974. The USA can accommodate their small reduction in earlier models of the B-52 bomber, for which the total of 425 in 1958 had already reduced to 75 in 1979.

37. Although SALT I and II were bilateral negotiations, the USA was very conscious of the concerns of its NATO allies. In particular, the definition of what is "strategic", interpreted by the USSR as signifying power to attack the home territory of the USSR or USA, cannot be accepted by the

countries of Western Europe. For them a nuclear weapon on their capital city would be distinctly strategic.

38. The need for "coupling" or linkage" between theatre and central (or strategic) deterrence is considered by the Europeans to be crucial. If SALT II makes the central strategic nuclear balance equivalent and stable, it may be harder to see direct and close linkage to deterrence in the European theatre. An isolated "Eurostrategic balance" would become isolated from the central balance, separating the European allies from the American nuclear guarantee.

39. Consequently, it can be seen that even if SALT II should be ratified, it will leave considerable business to be finished. The USA will need to deploy MX, in a basing mode providing sufficient concealment and mobility to make it invulnerable to a first strike by the MIRV mounted on the new Soviet heavy ICBMs. They will not be able to do this before the SS-18 deployment is completed, and it remains to be seen whether the level of verification that can be provided will be accepted by the USSR. The other two legs of the American strategic triad need refurbishing too, with Trident to replace the aging submarine missiles, and ALCM to preserve the capability of the heavy bomber to strike its targets. And the concerns of the NATO partners have already resulted in decision for a measure of theatre nuclear force modernization, involving long range cruise missiles of the type forbidden during the duration of the SALT II Protocol, as well as medium range ballistic missiles not addressed by SALT, and accompanied by an attempt to initiate some degree of arms control on theatre nuclear forces. These latter developments will enter into SALT III, should such negotia-

tions emerge, even though it is intended that they be conducted on a bilateral basis.

VERIFICATION

40. It is evident that the parties to these treaties have too much at stake to rely on unverified assurances. Some form of confirmation is necessary to provide a high degree of confidence that the terms of the agreement are being honoured.

41. In this regard there is an important inequality between the USA and USSR. The open society of the former, combined with the alert and observant faction always quick to criticize defence activity, make it certain that any significant violation on the part of the United States would be very quickly exposed from within. In contrast, the tight security in the USSR and their refusal to permit any substantial degree of "intrusive inspection" make verification of their activities considerably more difficult.

42. Fortunately for the prospects for SALT, the "National Technical Means" of verification, based primarily on reconnaissance satellites and interception of telemetry signals, allow a great deal of information to be gained about the deployment and the testing of weapon systems. Both of these means could be frustrated by intentional concealment and encryption of telemetry, but SALT II contains provisions to disallow "deliberate concealment" and "deliberate denial of telemetric information".

43. Unfortunately for the prospects of arms control, the countermeasures necessary to reduce the vulnerability of land-

based systems to a disarming first strike are likely to depend on concealment and mobility. To increase survivability, it is probable that missiles will be made mobile, and placed in canisters which fulfill some of the functions of a launcher. It will then be necessary to place these in locations which will not permit efficient and accurate targeting by the opponent. This would be comparatively easy in the absence of a requirement for verification, but if it is necessary to let the other party see the missiles, to confirm that their numbers are within the agreed limits, then the designer has conflicting objectives to meet. Various schemes are being proposed which offer compromises between high survivability and high assurance of verification. However, there is a fundamental conflict between the indicated measures to reduce vulnerability of land-based missiles and the undertaking "not to use deliberate concealment measures which impede verification by national technical means". It may not arise until there is a firm program to deploy a mobile missile system.

44. Aside from the problem of concealment, a number of provisions in SALT II, such as those establishing "counting rules", "Functionally Related Observable Differences" (FRODs) and other externally observable differences, should permit a reasonably effective level of verification, but "FRODs" depend on cooperation and the possibility exists of deliberate contravention. Most of these features refer to the type of weapons systems carried by aircraft. Quite a lot can be learned by observing the movements of aircraft and the type of missions for which they appear to be training. It is probably now the case that bombers are the least important of the three strategic offensive systems, whether they are carrying Air Launched Cruise Missiles, Air-to-Surface

Ballistic Missiles, or old fashioned bombs.

45. A number of improvements to systems, such as increases to the number of multiple warheads or lengthening the range of a cruise missile, probably could be made with little or no testing and no externally observable features.

46. An important feature of the treaty is that its numerical limits are expressed in terms of ICBM launchers, SLBM launchers, and heavy bombers. It does not forbid the manufacture of additional missiles, although they are not supposed to be deployed in the launcher area. Specification in terms of number of launchers and bombers was probably all that could be verified, since satellite photography can show silos, submarines, and aircraft, but cannot show the contents of storage magazines. It is true, of course, that an important objective of SALT is to prevent a first-strike capability, and that a carefully synchronized first strike probably would not allow the time for reloading ICBM launchers or returning submarines or bombers to partake in the same mission. However, many of the strategic calculations involve considerations of residual forces remaining after a first counterforce exchange, and for these purposes reload weapons could make a significant difference.

47. The difference between counting launchers and counting missiles may become important if mobile ICBM or GLCM systems are deployed, as permitted after expiry of the protocol, and a dispute could arise over the status of a canister containing a missile and playing a role in its launching.

CANADIAN POINT OF VIEW AS A MEMBER OF THE UNITED NATIONS

48. The concerns of the civilized world include a very strong desire to avoid a nuclear war between the Superpowers. Many nations believe that mutual and stable nuclear deterrence works towards this end, many believe that detente does too. In spite of its limitations, SALT II is likely to support both of these.

49. Probably more important than the advantages of a ratified SALT II are the disadvantages of a SALT II rejected by the American Senate without an agreement. The USA has the technical knowledge and the economic resources to keep the central strategic balance stable by its own unilateral actions. But the political consequences of a rejection of the Treaty could be severe, and very damaging to the prospects for detente and international arms control.

CANADIAN POINT OF VIEW AS AN ALLY AND
NEIGHBOUR OF THE UNITED STATES

50. Unlike the European allies, Canada has a virtually automatic guarantee of the benefits of the American central strategic deterrent. We are too close neighbours for there to be any problem of "decoupling". However, our closeness brings certain dangers as well.

51. If a nuclear war ever did occur between the USA and the USSR, Canada would very quickly cease to be a detached international observer. The location of the Minuteman complexes in the Northern United States, together with the probability that a counterforce attack on them would use ground burst nuclear warheads of high yield, make it likely

that dense radioactive fallout would descend over some of the most populated areas of Southern Canada.

52. Quite apart from a strike designed only against Minuteman, there is every probability that an attack would include other types of targets: early warning installations, strategic airfields, command and control centres, and naval bases in a first strike by missiles; air defence installations if bombers formed part of the attack; centres of industry, communication, and population in an all-out attack on the basic strength of North America. In any of these latter instances some of the targets would be in Canada.

53. With such a threat in the background, Canada has a double stake in two of the objectives of SALT II. The first and greatest is to prevent the outbreak of a nuclear war, for which the chief hope is stable nuclear deterrence. The second is to limit the damage in case deterrence fails. To the extent that the number of weapons is limited, SALT II makes a small step in this direction.

CANADIAN POINT OF VIEW AS A MEMBER OF
THE NORTH ATLANTIC ALLIANCE

54. Although Canada is assured of the direct protection of the USA, it has every reason to help reduce the probability of an attack on America. With central strategic deterrence stabilized at a state of equivalence, it has a correspondingly decreased capability to deter confrontation other than ones directly between the two Superpowers. A crisis in Europe might escalate to an uncontrollable level before the USA and USSR were brought face to face. Thus, a neighbour of the USA who would share the consequences of a central strategic exchange has good reason to concern itself over the security and

stability of another region which could be the site of the first outbreak and subsequent escalation.

55. Once the fortunes of the North Atlantic Alliance are taken into account, the significance of the SALT II appears less important for its intrinsic content, but more promising as a preamble to a more comprehensive SALT III.

56. The questions of the Forward Based Systems in Europe (and of the nuclear strike aircraft on carriers) must be faced and incorporated before much more can be accomplished in arms control with the USSR. The questions of the disparity in long-range theatre nuclear systems must be solved before stability could be prevented by unrestrained buildup on the part of the WPO. All of these questions form the grist for the mill of SALT III, and it appears most unlikely that SALT III can be initiated without a satisfactory conclusion to SALT II.

SUMMARY

57. With or without SALT II, there are several strategic imbalances that will cause difficulties in the years ahead. Ratification of SALT II will not solve them, but it would preserve the opportunity to negotiate agreements in the future that could reduce the probability that either side will simply try to solve its problems by extensive uncontrolled armament.

58. SALT II legitimizes Soviet superiority in heavy ICBMs. This is rapidly translated into a first strike capability against American land-based systems. The countermeasure is to build a new ICBM, the MX, using con-

cealment and mobility. While reducing the vulnerability of the system, this poses problems for the Soviets' ability to verify the numbers of MX deployed.

59. SALT II permits two other important American programs, Trident to replace the obsolescent SLBMs and ALCM to preserve the striking power of the heavy bombers.

60. SALT II does nothing to pacify Soviet concerns over NATO's Forward Based Systems in Europe, nor NATO concerns over Soviet superiority in European long-range theatre nuclear forces. The latter problem may be solved by deployment of cruise missiles and MRBMs in Europe, provided that Soviet buildup is not accelerated. All the SALT II protocol does is confirm that any form of arms control over cruise missiles was too difficult to complete in 1979.

61. What with the problems of cruise missiles, European systems threatening the USSR directly, and the existence of independent British, French, and Chinese nuclear forces, SALT III offers little hope of easy or early progress.

62. To fill gaps and reduce vulnerabilities, the West will be obliged to pursue their programs on MX, Trident, strategic ALCM, and theatre nuclear force modernization. If SALT II is ratified they can initiate the difficult process of negotiating some form of arms control that will need to concentrate more on theatre than on strategic nuclear systems.

63. Canada has a vital interest in the preservation of strategic nuclear deterrence, enhanced by our geographic location down-wind from US missile fields. She also has a stake in nuclear deterrence in Europe.

FIG. 1: ICBMs

Location on vertical scale indicates throw weight.
Thickness on vertical scale indicates number of independent warheads,
(i.e., MIRV but not MRV).

SS-18

Assume 10 MIRV.
Assume that USSR will deploy 308, limit of number of heavy ICBMs, allowed
by SALT II.

SS-9

Assume that all SS-9 will be replaced by SS-18.

SS-19, SS-17

Assume 6 MIRV for SS-19, 4 for SS-17.
820 MIRVed ICBM limit, less 308 SS-9, permits 512 total for SS-19 plus SS-17.

SS-11

Assume reductions to accommodate SALT II limit to total number of strategic
nuclear delivery vehicles.

SALT II

Numbers of Fig. 1 comply with SALT II limit of 820 MIRVed ICBMs.
Numbers on Figs. 1 and 2 comply with SALT II limit of 1200 MIRVed ICBMs plus
SLBMs.
Numbers of Figs. 1, 2, and 3 comply with SALT II limit of 2400 strategic
nuclear delivery vehicles in 1980, 2250 thereafter through 1985.

NEW SOVIET ICBM

SALT II permits a new light Soviet ICBM. If deployed, it would take the place of some SS-19 or SS-17 (if MIRVed), or SS-11 or SS-13 if not MIRVed.

MX

SALT II permits a new light US ICBM. This would be the M.I., and would probably replace Minuteman III on a one-for-one basis. First deployment 1985, IOC, 1986. 200 mobile missiles in 4600 shelters by end of 1989. 10 MIRV.

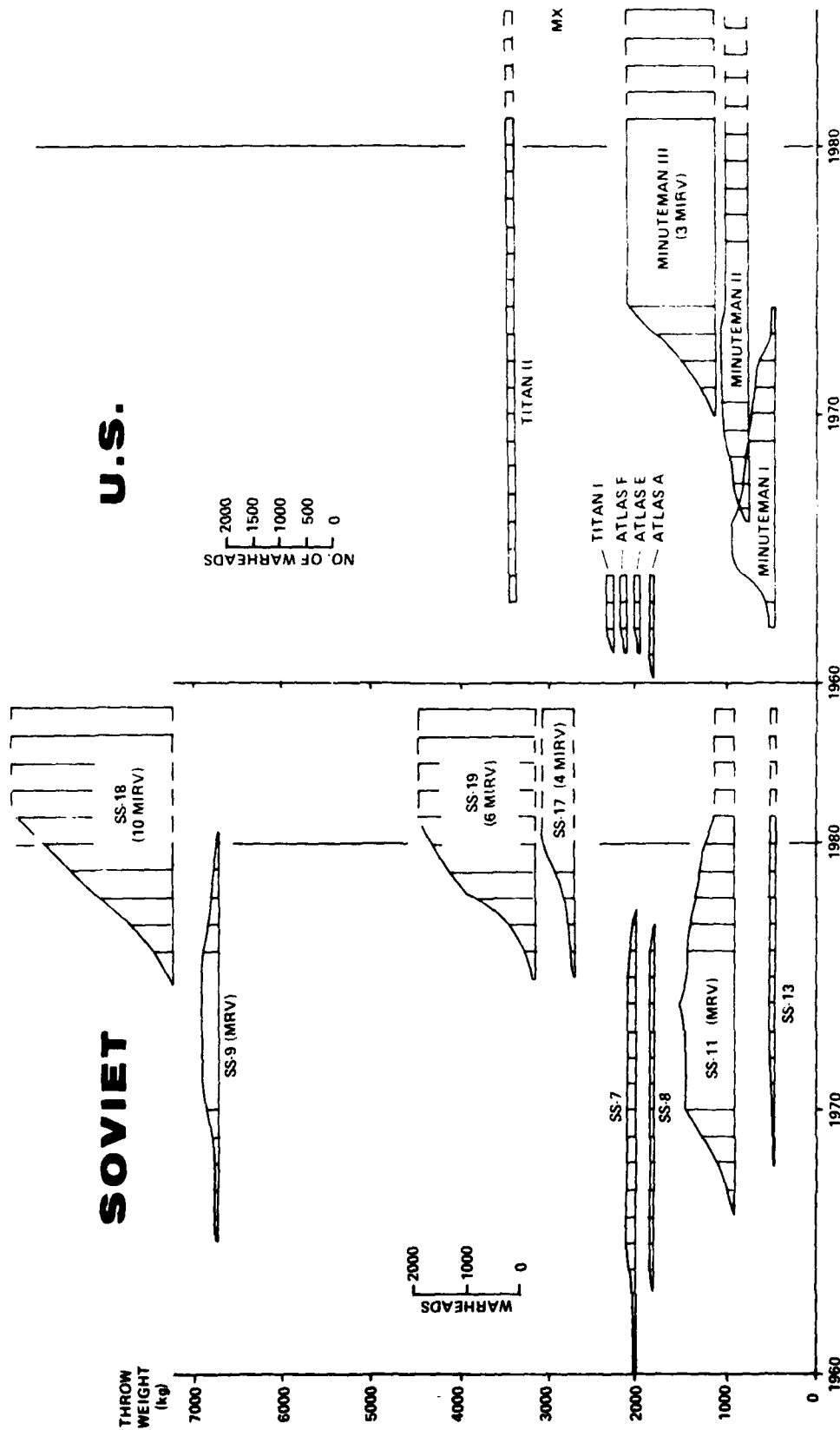


Fig. 1 ICBMs: THROW-WEIGHT AND NUMBER OF INDEPENDENT WARHEADS

1960 1970 1980

FIG. 2: SLBMs

Location on vertical scale indicates missile range.
Thickness (or "height") on vertical scale indicates number of independent warheads (i.e., MIRV but not MRV).

SS-N-8

Assume single warhead, 12 carried by Delta I, 16 by Delta II SSBNs.

SS-N-18

Assume 3 MIRV.

Solid fuel successor to SS-N-8, 16 in Delta III SSBNs.

SS-NX-17

Experimental solid-fuel successor to SS-N-6.

Assume will not be deployed in quantity.

SS-N-6

Assume one modification (no. 3) has 3 MIRV.

16 in Yankee I SSBNs.

Reduced in number as SS-N-18 numbers build up.

Trident C-4

Assume 7 MIRV.

Builds up with conversion of 12 Polaris SSBNs (16 Trident C4 SLBMs), to be completed by 1982, and construction of 8 new Ohio SSBNs (24 Trident C4 SLBMs), with IOC 1981.

SALT II

Numbers on Figs. 1 and 2 comply with SALT II limit of 1200 MIRVed ICBMs plus SLBMs.
Numbers on Figs. 1, 2, and 3 comply with SALT II limits of 2400 strategic nuclear delivery vehicles in 1980, 2250 thereafter through 1985.

NEW SOVIET SLBM

SALT II permits new SLBMs. A new MIRVed Soviet SLBM could take the place of the indicated buildup of SS-N-18, or could replace SS-N-8.

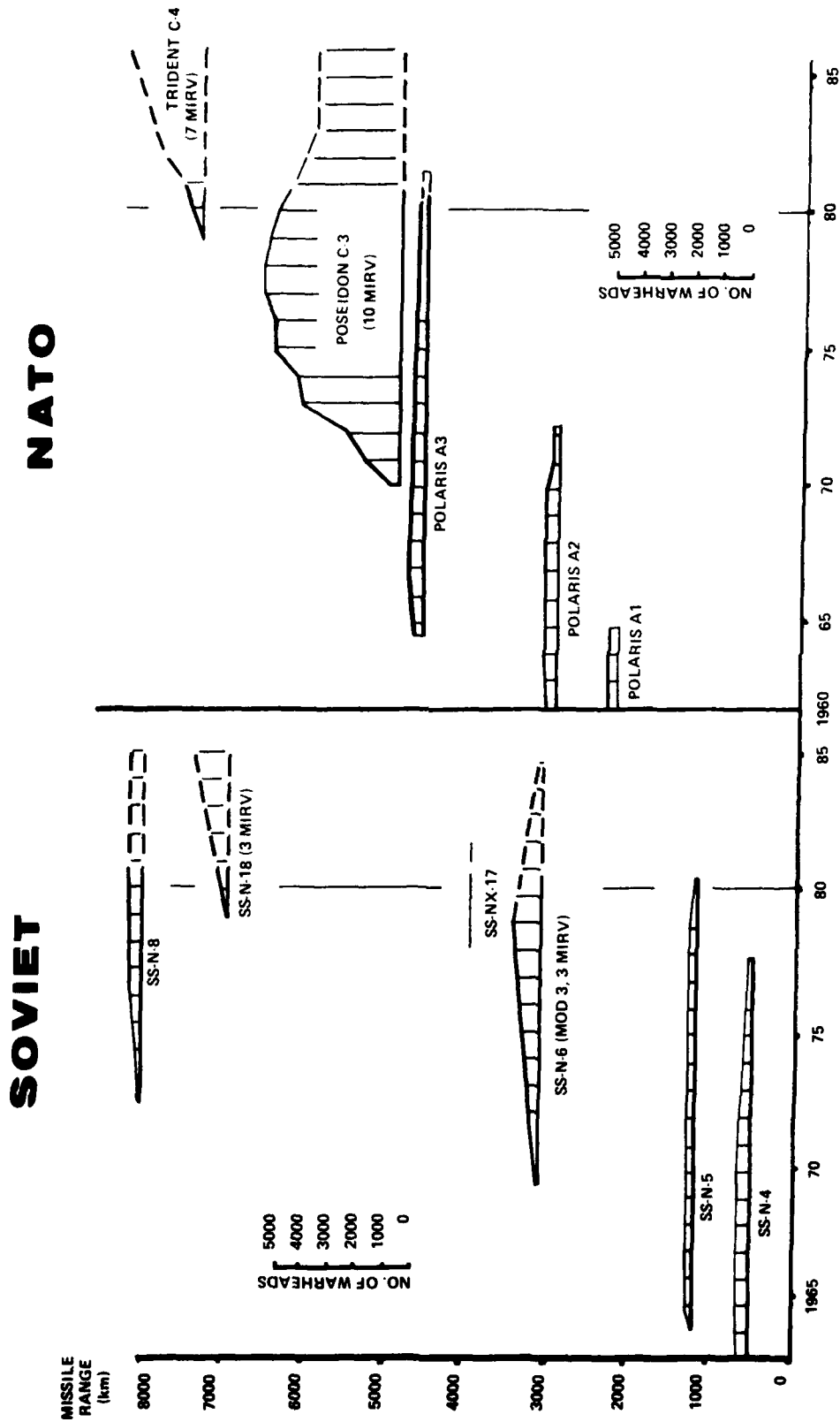


Fig. 2 SLBMs: MISSILE RANGE AND NUMBER OF INDEPENDENT WARHEADS

FIG. 3: INTERCONTINENTAL BOMBERS

Location on vertical scale indicates bomber payload.

Thickness on vertical scale indicates number of bomber aircraft.

ALCM

Air-launched cruise missiles will be deployed on US bombers in the early 1980s, twenty on a B-52G. IOC 1982.

120 bombers equipped with ALCM can be deployed within SALT II limits, or more if numbers of MIRVed ICBM + SLBM are correspondingly reduced. 2100 missiles expected by 1986, all the 151 B-52G could accommodate 3020 ALCM by 1990.

SALT II

Numbers on Figs. 1, 2, and 3 comply with SALT II limit of 2400 strategic nuclear delivery vehicles in 1980, 2250 thereafter through 1985.

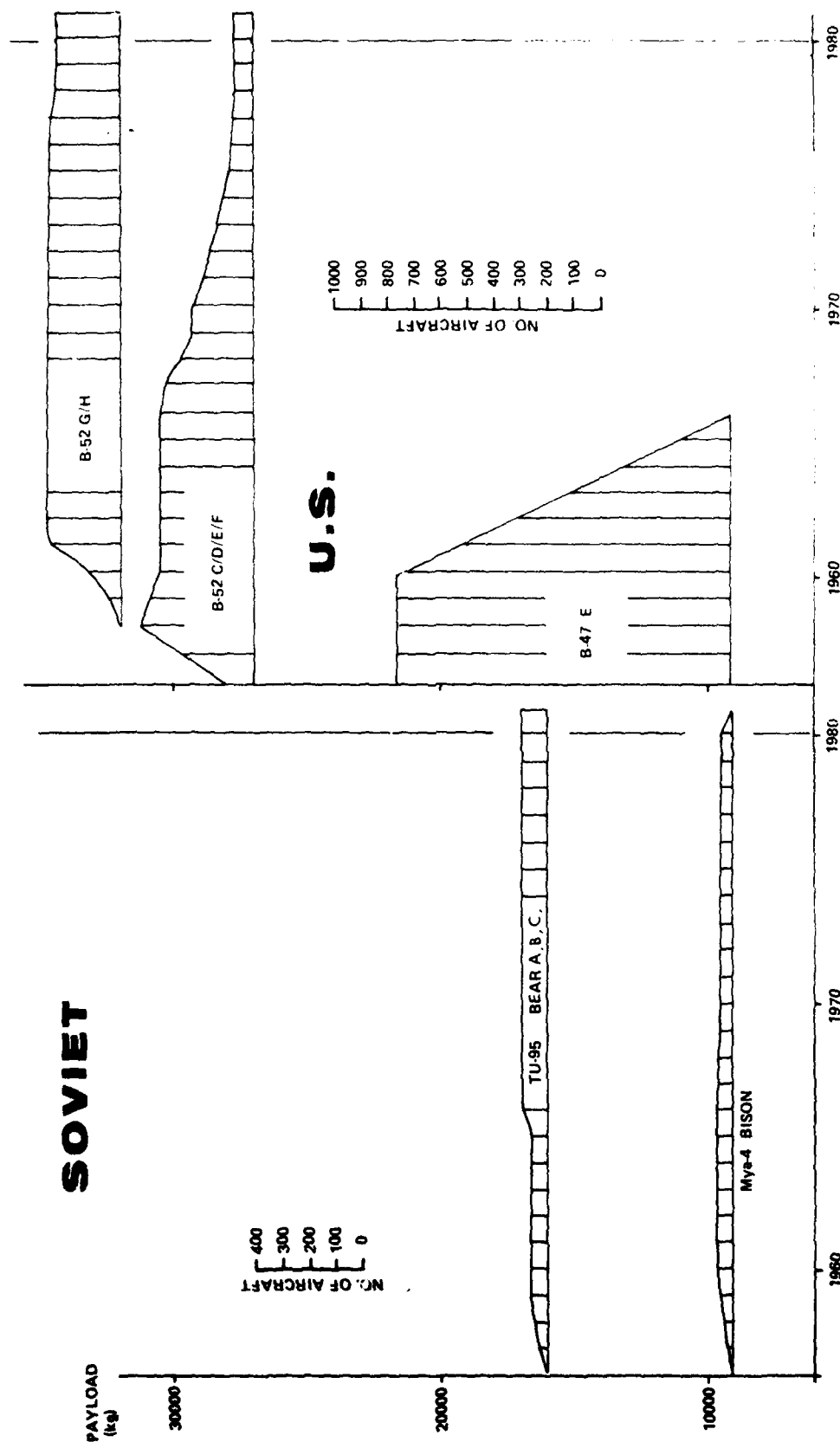


Fig. 3 INTERCONTINENTAL BOMBERS: PAYLOAD AND NUMBER OF AIRCRAFT

UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA - R & D		
(Security classification of title, body of abstract and indexing annotation must be entered when the overall document is classified)		
1. ORIGINATING ACTIVITY Department of National Defence Operational Research and Analysis Establishment		2a. DOCUMENT SECURITY CLASSIFICATION UNCLASSIFIED 2b. GROUP
3. DOCUMENT TITLE The SALT Treaty From a Canadian Point of View		
4. DESCRIPTIVE NOTES (Type of report and inclusive dates)		
5. AUTHOR(S) (Last name, first name, middle initial) Lindsey, G.R.		
6. DOCUMENT DATE April 1980	7a. TOTAL NO. OF PAGES 34	7b. NO. OF REFS
8a. PROJECT OR GRANT NO. 96104	9a. ORIGINATOR'S DOCUMENT NUMBER(S) ORAE Report No. R74	
8b. CONTRACT NO.	9b. OTHER DOCUMENT NO.(S) (Any other numbers that may be assigned this document)	
10. DISTRIBUTION STATEMENT Qualified requesters may obtain copies of this document from their defence documentation centre.		
11. SUPPLEMENTARY NOTES	12. SPONSORING ACTIVITY ORAE	
13. ABSTRACT <p>With or without SALT II there are several strategic imbalances that will cause difficulties in the years ahead. Ratification of SALT II will not solve them, but it would permit programs that would redress them, and would preserve the opportunity to negotiate agreements in the future that could reduce the probability that each side will simply try to solve its problems by extensive uncontrolled buildup of weapons. All the SALT II protocol does is to confirm that any form of arms control over mobile ICBMs or cruise missiles was too difficult to complete in 1979.</p> <p>What with the problems of cruise missiles, European systems threatening the USSR directly, and the existence of independent British, French, and Chinese nuclear forces, a SALT III that addressed these subjects would face extreme difficulties, with little hope of easy or early progress.</p> <p>Canada has a vital interest in the preservation of strategic nuclear deterrence, enhanced by our geographic location down-wind from US missile fields. She also has a stake in the success of nuclear deterrence in Europe.</p>		

UNCLASSIFIED

Security Classification

KEY WORDS

SALT II
strategic imbalance
arms control
nuclear deterrence

INSTRUCTIONS

1. **ORIGINATING ACTIVITY** Enter the name and address of the organization issuing the document.
- 2a. **DOCUMENT SECURITY CLASSIFICATION:** Enter the overall security classification of the document including special warning terms whenever applicable.
- 2b. **GROUP:** Enter security reclassification group number. The three groups are defined in Appendix 'M' of the DRB Security Regulations.
3. **DOCUMENT TITLE:** Enter the complete document title in all capital letters. Titles in all cases should be unclassified. If a sufficiently descriptive title cannot be selected without classification, show title classification with the usual one-capital-letter abbreviation in parentheses immediately following the title.
4. **DESCRIPTIVE NOTES:** Enter the category of document, e.g. technical report, technical note or technical letter. If appropriate, enter the type of document, e.g. interim, progress, summary, annual or final. Give the inclusive dates when a specific reporting period is covered.
5. **AUTHOR(S):** Enter the name(s) of author(s) as shown on or in the document. Enter last name, first name, middle initial. If military, show rank. The name of the principal author is an absolute minimum requirement.
6. **DOCUMENT DATE:** Enter the date (month, year) of Establishment approval for publication of the document.
- 7a. **TOTAL NUMBER OF PAGES:** The total page count should follow normal pagination procedures, i.e., enter the number of pages containing information.
- 7b. **NUMBER OF REFERENCES:** Enter the total number of references cited in the document.
- 8a. **PROJECT OR GRANT NUMBER:** If appropriate, enter the applicable research and development project or grant number under which the document was written.
- 8b. **CONTRACT NUMBER:** If appropriate, enter the applicable number under which the document was written.
- 9a. **ORIGINATOR'S DOCUMENT NUMBER(S):** Enter the official document number by which the document will be identified and controlled by the originating activity. This number must be unique to this document.
- 9b. **OTHER DOCUMENT NUMBER(S)** If the document has been assigned any other document numbers (either by the originator or by the sponsor), also enter this number(s).
10. **DISTRIBUTION STATEMENT:** Enter any limitations on further dissemination of the document, other than those imposed by security classification, using standard statements such as:
 - (1) "Qualified requesters may obtain copies of this document from their defence documentation center."
 - (2) "Announcement and dissemination of this document is not authorized without prior approval from originating activity."
11. **SUPPLEMENTARY NOTES:** Use for additional explanatory notes.
12. **SPONSORING ACTIVITY:** Enter the name of the departmental project office or laboratory sponsoring the research and development. Include address.
13. **ABSTRACT:** Enter an abstract giving a brief and factual summary of the document, even though it may also appear elsewhere in the body of the document itself. It is highly desirable that the abstract of classified documents be unclassified. Each paragraph of the abstract shall end with an indication of the security classification of the information in the paragraph (unless the document itself is unclassified) represented as (TS), (S), (C), (R), or (U).

The length of the abstract should be limited to 20 single-spaced standard typewritten lines; 7½ inches long.
14. **KEY WORDS:** Key words are technically meaningful terms or short phrases that characterize a document and could be helpful in cataloging the document. Key words should be selected so that no security classification is required. Identifiers, such as equipment model designation, trade name, military project code name, geographic location, may be used as key words but will be followed by an indication of technical context.

FILMED
8-8